DRAFT

Reed Canarygrass Cover Success Standards for WSDOT Wetland Mitigation Sites in Washington

Reed canarygrass (*Phalaris arundinacea*) control is a major maintenance component in many western Washington wetland mitigation sites. This aggressive grass is adapted to withstand a variety of hydrologic regimes, soil conditions and, to a certain extent, solar exposure. In response to the detrimental aspects of reed canarygrass (RCG), the US Army Corps of Engineers (COE), Washington Department of Ecology (Ecology), King County DDES (KC), and other county jurisdictions have frequently limited the allowable extent of aerial coverage to no more than 10 percent within the mitigation site throughout the monitoring period. While this coverage requirement is attainable, albeit expensive, on many WSDOT sites, it is not reasonable on others.

Recent research sponsored by WSDOT and the US Environmental Protection Agency (Celedonia, 2002) determined that while employing accepted RCG control measures (USDA-NRCS, 2001), RCG cover percentages varied on 24 sites between 1 to 40 percent with the median coverage fluctuating between 2 to 31 percent for years 6-11 following planting. Annual monitoring data for younger mitigation sites (between 2-5 years after planting) support this finding (WSDOT 2001, 2002).

WSDOT data indicates that RCG cover in excess of 10 percent does not prevent attainment of success standards for woody species cover. Of the aforementioned 24 mitigation sites monitored, sites with woody cover in excess of 80% contained a RCG cover between 0-55% with a median of 20%. In naturally occurring wetlands, numerous highly functioning Category I wetlands in the Northwest Region have RCG coverage well in excess of 10 percent, such as South Lake Sammamish, Mercer Slough, and the Snohomish River Delta.

Maintaining such a high standard of RCG coverage on all mitigation sites has severe implications to WSDOT. As a government agency, WSDOT is accountable for the expenditure of public funds. Failure to meet mitigation performance standards implies an inability to meet projected, measurable goals and indicates noncompliance and a failure of our mitigation. A mitigation design that may well cost hundreds of thousands of dollars in design and construction fees, property purchase, and materials, can be viewed as a failure if a or one success standard is not met. A mitigation site that may provide all the intended functions and meet all success standards except the 10 percent RCG threshold may be considered a complete failure in the public's eye. In today's environment of accountability, such a failure can erode public trust.

To meet the 10 percent RCG coverage, WSDOT mows, hand weeds, or applies herbicide. Each control method risks harm to desirable mitigation plantings, e.g., plants trampled or cut using mechanical measures and/or mortality from herbicide over-spray. The result of each method can often be just as damaging to the plantings as to the RCG.

Beyond the simple costs of maintaining the 10 percent RCG cover standard (including replanting of accidental plant damage), is the question of the RCG cover standard itself. Are there credible and scientifically defensible data supporting 10 percent cover as a meaningful threshold? Does RCG coverage in excess of 10 percent adversely impact the development of the mitigation site? Will RCG coverage in excess of 10 percent limit establishment of woody vegetation? Does this 10 percent threshold limit the attainment of woody vegetation cover and survival standards, species richness goals, and limit wildlife habitation? Does exhaustive management of RCG during the monitoring period compound the temporal loss of wildlife habitat functions by creating disturbance during the breeding season of numerous species?

Our research and monitoring results indicate that attainment of a 10 percent RCG threshold during the monitoring period has little impact on the health, viability, or function of the mitigation site. Research of 24 mitigation sites indicate that forested and scrub-shrub wetlands can be established with RCG coverage in excess of 10 percent (Celedonia, 2002).

There are several revisions to the RCG threshold that may provide guarantees to regulatory agencies concerning non-native invasive species, while allowing WSDOT flexibility with RCG control:

1. **Establish a flexible RCG cover that truly represents the existing conditions of the mitigation site and adjacent properties**.
   Raise the cover standard of RCG to a more realistic and attainable level on sites that are either dominated by or surrounded by sites dominated by RCG. WSDOT will work with the agencies to establish appropriate woody cover standards. RCG control measures will continue to be employed through construction and maintenance of the mitigation site.

   Example: The wetlands on-site and on adjacent properties contain RCG cover that varies between 50-75%. The RCG cover for the wetland mitigation will not exceed 50% cover during the monitoring period. The proposed mitigation will meet woody cover standards as defined in the performance measures and standards of success.

2. **Set the RCG cover standard to match the impact site.**
   Many impact sites have significantly higher levels of RCG than associated mitigation sites. WSDOT can often demonstrate an improvement to the functions and values of many of impact sites, yet not meet the 10 percent cover standard. In this case, the net "value" of the resource will actually increase. Identical methods can be used for both pre-impact analysis and mitigation compliance monitoring to assure the accuracy of the cover data.

   Example: The impacted wetlands contain approximately 75% RCG cover. The RCG cover for the wetland mitigation will not exceed 50% cover during the monitoring period. The proposed mitigation will meet woody cover standards as defined in the performance measures and standards of success.

3. **Remove the cover threshold entirely for sites where the ultimate goal is to establish woody vegetation.**
   Use the woody vegetation cover and hydrology success standards as the tool determining the mitigation success for sites dominated by RCG that provide a high degree of water quality improvement function.

   Example: The proposed mitigation will meet woody cover standards as defined in the performance measures and standards of success.

4. **Set the cover standard to match proposed functions of the mitigation.**
   Increase or eliminate the RCG cover standard for sites that will provide primary water quality functions. A lower RCG standard will remain for sites that intend to provide non-water quality functions such as wildlife habitat.

   Example:
   Objective: To provide sediment trapping and nutrient/toxicant removal functions.
   Performance Measure/Success Standard: The mitigation site will achieve 80% aerial cover of herbaceous vegetation by monitoring year 2.

5. **Set a RCG cover standard that varies over the monitoring period and correlates to woody cover percentage.**
   Maintain lower RCG cover standards for Years 1-3 in developing forested and scrub-shrub communities. Increase the RCG cover in later years as woody vegetation matures and cover increases if woody cover standards are being met. In emergent or herbaceous communities, maintain lower RCG standards.

   Example:
   Years 1-3
   RCG cover for the wetland mitigation will not exceed 15% (how about 20%?) cover.

   Years 4-6
   RCG cover for the wetland mitigation will not exceed 30% cover. If woody cover standards as defined in the performance measures are not met, the RCG cover standards for Years 1-3 shall apply.

   Years 7-10
   RCG cover for the wetland mitigation will not exceed 50% cover. If woody cover standards as defined in the performance measures are not met, the RCG cover standards for Years 4-6 shall apply.

6. **Allow higher RCG cover standards if an aggressive maintenance program is employed.**
   Permit higher RCG cover standards if a detailed, comprehensive, and aggressive maintenance plan is submitted as part of the mitigation plan. The maintenance program will focus on attainment of all success standards, including RCG cover

standards, and rely on monthly site inspections, as well as annual monitoring results, to guide the maintenance activities. Specific RCG control maintenance activities will include herbicide applications, mulching, and plant replacement among others.

Example: RCG cover thresholds will be established as Performance Measures (and not Success Standards) to guide the RCG maintenance program. The proposed mitigation will rely on woody cover Success Standards to determine final success. If interim Performance Measure thresholds for woody cover and RCG cover are not met, then contingencies will be employed.

7. **Eliminate RCG cover standards entirely for sites that incorporate RCG control research.**
   On wetland enhancement sites that are dominated by RCG, RCG cover standards will be eliminated as criteria to measure the success of the site if the mitigation design and maintenance incorporates varying methods of RCG control. The various control measures will be monitored through the life of the monitoring period. The results of the research will be presented to agency staff in the biannual monitoring and the final close out reports.

   Example: The wetland enhancement site will be divided into four-reed canarygrass control plots.
   - Plot 1 will incorporate herbicidal control measures. Rodeo will be applied to the entire plot twice each year, once in mid-June and a second in mid-August.
   - Plot 2 will measure control of RCG with the incorporation of 6 inches of sawmill waste into the soil to a depth of 10 inches.
   - Plot 3 will employ the incorporation of 6 inches of sawmill waste into the soil to a depth of 10 inches. Rodeo will be applied to the entire plot twice each year in mid-June and Mid-August.
   - Plot 4 will control all RCG present within 1 foot of planted woody vegetation. Control measures will be limited to string trimmers and trampling.

8. **Grant WSDOT greater freedom to control RCG utilizing site design techniques.**
   The ability of RCG to thrive on sites that are highly saturated or completely inundated through major portions of the growing season make RCG control difficult if not impossible on wetland enhancement sites. The best hope for a long-term control measure is the establishment of a conifer-dominated forest canopy (USDA-NRCS, 2001). To establish this type of community, the site needs to be drier yet still meet the hydrology success standard. To accomplish this, either site drainage patterns need to be altered, or site elevations need to be raised. The former option is not usually feasible, while the latter has not been allowed.

   Example: On saturated wetland enhancement sites that are dominated by RCG permit construction of compost-filled berms and islands. These structures will act as a raised platform for the installation of coniferous and deciduous trees. These structures will increase shading within the wetland over time thus creating a more natural RCG

control measure. The islands and berms will increase structure and complexity within the enhancement area.

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